

REMARKS

Applicants respectfully request reconsideration of the above-identified application in view of the foregoing amendments and the following remarks.

In the December 29, 2003 Office Action, the Examiner noted that claims 1-4 were pending in the application and that claims 1-4 were rejected. By this Amendment, claim 2 is amended. Applicants believe that claims 1-4 are in condition for allowance. The Examiner's rejections are respectfully traversed below.

Rejection Under 35 U.S.C. §102(a) – EP 0992682 (Sugiura et al.)

In the Office Action, the Examiner rejected claims 1 and 2 under 35 U.S.C. § 102(a) as being anticipated by EP 0992682 (Sugiura et al.). Sugiura et al. discloses a piston compressor in which the neck of the piston has both shoe seating surfaces provided with a metal-sprayed layer. *Col. 4, Ins. 19-21.* According to Sugiura et al., metals suitably used for metal spraying include copper-based metal materials. *Col. 4, Ins. 28-30.* Further according to Sugiura et al., metals suitably used for metal spraying contain an additive of a solid lubricant, including lead. *Col. 4, Ins. 34-39.*

In the present application, claim 1 recites a component of a compressor, said component including a lubricating surface portion in a slide contact area, the lubricating surface portion being formed of a copper based metal which does not contain lead but contains solid lubricant comprising at least one of graphite, molybdenum disulfide, boron nitride, tungsten disulfide, carbon fluoride, calcium fluoride, barium fluoride, boron oxide and indium. Claim 2 recites a component of a compressor, said component including a lubricating surface portion in a slide contact area, the lubricating surface portion being formed of a copper based metal which does not contain lead but contains solid lubricant other than lead, wherein a lubricating film made of a

copper based metal containing a solid lubricant is provided in said slide contact area to form said lubricating surface portion.

Because lead is present in the disclosure of the lubricating surface portion of the shoe seating surfaces of Sugiura et al., but specifically excluded from applicants' claimed lubricating surface portion, Sugiura et al. cannot anticipate claims 1 and 2.

Accordingly, withdrawal of the Examiner's rejection is respectfully requested.

Rejection Under 35 U.S.C. §102(a) – EP 1010771 (Yamada et al.)

In the Office Action, the Examiner rejected claim 2 under 35 U.S.C. § 102(a) as being anticipated by EP 1010771 (Yamada et al.). Yamada et al. discloses a swash plate of a swash-plate type compressor, wherein the swash plate has a surface sliding layer constructed from a high Si aluminum alloy. *Paragraph [0001]*. According to Yamada et al., when the Si content of the aluminum alloy is less than 12%, the enhancement effects of wear resistance are slight.

Paragraph [0017]. Further, according to Yamada et al., when the Si contents exceeds 60%, it is difficult to produce the alloy powder to be flame-sprayed. *Paragraph [0017]*. According to Yamada et al., a preferable Si content of the aluminum alloy is 15 to 50%. *Paragraph [0017]*. Yamada et al. teaches that the aluminum alloy can contain optional elements such as copper.

Paragraph [0020]. According to Yamada et al., when the copper content exceeds 8.0%, the alloy is excessively hardened such that appropriate sliding material is not provided. *Paragraph [0020]*. Thus, according to Yamada et al., a preferable copper content is from 0.5 to 5%. *Paragraph [0020]*.

In the present application, claim 2 recites a component of a compressor, said component including a lubricating surface portion in a slide contact area, the lubricating surface portion being formed of a copper based metal which does not contain lead but contains solid lubricant

other than lead, wherein a lubricating film made of a copper based metal containing a solid lubricant is provided in said slide contact area to form said lubricating surface portion.

The high Si aluminum alloy of Yamada et al. which may optionally contain up to 8.0 % copper is not a “copper based metal,” as copper does not form the majority of the alloy. Thus, Yamada et al. cannot anticipate claim 2.

Accordingly, withdrawal of the Examiner’s rejection is respectfully requested.

Rejection Under 35 U.S.C. §103(a) – EP 1010771 (Yamada et al.) in view of EP 0890743 (Kanayama et al.)

In the Office Action, the Examiner rejected claim 3 under 35 U.S.C. § 103(a) as being obvious over EP 1010771 (Yamada et al.) in view of EP 0890743 (Kanayama et al.).

In the present application, claim 3 recites a component of a compressor, said component including a lubricating surface portion in a slide contact area, the lubricating surface portion being formed of a copper based metal which does not contain lead but contains solid lubricant other than lead, wherein a lubricating film made of a copper based metal containing a solid lubricant is provided in said slide contact area to form said lubricating surface portion, wherein said lubricating film is made on a base metal by sintering.

Yamada et al. discloses a swash plate of a swash-plate type compressor, wherein the swash plate has a surface sliding layer constructed from a high Si aluminum alloy. *Paragraph [0001]*. According to Yamada et al., when the Si content of the aluminum alloy is less than 12%, the enhancement effects of wear resistance are slight. *Paragraph [0017]*. Further, according to Yamada et al., when the Si contents exceeds 60%, it is difficult to produce the alloy powder to be flame-sprayed. *Paragraph [0017]*. According to Yamada et al., a preferable Si content of the aluminum alloy is 15 to 50%. *Paragraph [0017]*. Yamada et al. teaches that the aluminum alloy can contain optional elements such as copper. *Paragraph [0020]*. According to

Yamada et al., when the copper content exceeds 8.0%, the alloy is excessively hardened such that appropriate sliding material is not provided. *Paragraph [0020]*. Thus, according to Yamada et al., a preferable copper content is from 0.5 to 5%. *Paragraph [0020]*. There is no teaching or suggestion in Yamada et al. of a “copper based metal.”

Kanayama et al. does not make up for the deficiencies of Yamada et al. Kanayama et al. discloses a surface-treatment technique for improving the sliding characteristics of a swash plate consisting of iron or aluminum-based material. *Page 2, lns. 7-8*. Thus, the combination of Kanayama et al. with Yamada et al. would not render obvious claim 3.

Accordingly, withdrawal of the Examiner’s rejection is respectfully requested.

Rejection Under 35 U.S.C. §103(a) – EP 0992682 (Sugiura et al.) in view of EP 1010771 (Yamada et al.)

In the Office Action, the Examiner rejected claim 4 under 35 U.S.C. § 103(a) as being obvious over EP 0992682 (Sugiura et al.) in view of EP 1010771 (Yamada et al.).

In the present application, claim 4 recites a component of a compressor, said component including a lubricating surface portion in a slide contact area, the lubricating surface portion being formed of a copper based metal which does not contain lead but contains solid lubricant comprising at least one of graphite, molybdenum disulfide, boron nitride, tungsten disulfide, carbon fluoride, calcium fluoride, barium fluoride, boron oxide and indium, wherein said compressor comprises a swash plate type compressor having a swash plate rotatable with a rotating shaft, a piston, and a shoe disposed between the swash plate and the piston so as to make slide contact with said swash plate and said piston, whereby a rotational motion of said swash plate is transferred to said piston via said shoe to reciprocatingly move said piston, and said component is said swash plate, in which said swash plate has a lubricating surface and said shoe has a lubricating surface to make slide contact with the lubricating surface of said swash plate.

Sugiura et al. discloses a piston compressor in which the neck of the piston has both shoe seating surfaces provided with a metal-sprayed layer. *Col. 4, Ins. 19-21.* According to Sugiura et al., metals suitably used for metal spraying include copper-based metal materials. *Col. 4, Ins. 28-30.* Further according to Sugiura et al., metals suitably used for metal spraying contain an additive of a solid lubricant, including lead. *Col. 4, Ins. 34-39.*

Yamada et al. discloses a swash plate of a swash-plate type compressor, wherein the swash plate has a surface sliding layer constructed from a high Si aluminum alloy. *Paragraph [0001].* Yamada et al. does not make up for the deficiencies of Sugiura et al., namely the absence of the requirement that no lead be present in the copper-based material. Thus, the combination of Sugiura et al. with Yamada et al. would not render obvious claim 4.

Accordingly, withdrawal of the Examiner's rejection is respectfully requested.

CONCLUSION

For all the reasons advanced above, Applicants respectfully submit that the application is in condition for allowance and that action is earnestly solicited.

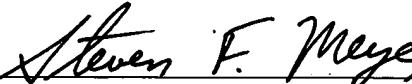
The Commissioner is hereby authorized to charge any additional fees which may be required for this amendment, or credit any overpayment to Deposit Account No. 13-4500, Order No. 5000-4996.

In the event that an extension of time is required, or may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. 13-4500, Order No. 5000-4996.

Respectfully submitted,
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